53(b) Divisional of U.S. Patent Serial Number: 09/108,317

REMARKS

Claims 1-4 are pending in this application, none of which have been amended. Claims 5-16 have been ~~amended~~ canceled. No new claims have been added.

In view of the aforementioned amendments and accompanying remarks, claims 1-4 are in condition for examination, which action, at an early date, is requested.

Attached hereto is a marked-up version of the changes made to the specification by the current amendment. The attached page is captioned "**VERSION WITH MARKINGS TO SHOW CHANGES MADE**".

In the event that this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees which may be due with respect to this paper, may be charged to Deposit Account No. 01-2340.

Respectfully submitted,

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Enclosures: Version With Markings To Show Changes Made
Substitute Abstract

53(b) Divisional of U.S. Patent Serial Number: 09/108,317

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE ABSTRACT:

The Abstract has been amended as follows:

A magneto-optical recording medium which includes a reproducing layer. When a laser beam is irradiated to the magneto-optical recording medium, a magnetic domain in a recording layer is transferred, through enlargement, to a reproducing layer increased in temperature. The magneto-optical recording medium further includes a calibration area that has a calibration magnetic domain recorded in a predetermined pattern in the recording layer. In a reproducing apparatus, a laser beam of an optical head is adjusted in output depending upon a reproduced signal obtained by reproducing the calibration magnetic domain.

IN THE SPECIFICATION:

Please amend specifications as follows:

Heading beginning at line 6 of page 1 has been amended as follows:

1. Field of the [invention] Invention

Paragraph beginning at line 5 of page 1 has been amended as follows:

This invention relates to a magneto-optical recording medium and recording/reproducing apparatus used therefor, and more particularly to a magneto-optical recording medium having a

recording layer and a reproducing layer so that microscopic magnetic domains can be recorded within the recording layer during [recordation] recording and the magnetic domains thus recorded are magnified and transferred to the reproducing layer during reproduction, and recording/reproducing apparatus used therefor.

Heading beginning at line 13 of page 1 has been amended as follows:

2. Description of the [prior art] Related Art

Paragraph beginning at line 8 of page 7 has been amended as follows:

Referring to Figure 4, a recording/reproducing apparatus 30 for a magneto-optical recording medium in this embodiment includes a spindle motor 32 to rotate a magneto-optical recording medium or optical disc 10. This spindle motor 32 is controlled by a servo circuit 34. At the above of the magnet-optical recording medium or disc 10, a magnetic head 36 is provided out of contact with the disc 10. A similar optical head is provided at the beneath of the disc 10. The magnetic head 36 is utilized not only to form record magnetic domains 22 (Figure 2) within a recording layer 14 (Figure 1) of the disc 10 but also to apply an alternating magnetic field for enlarging a magnetic domain 26 transferred to a reproducing layer 16. The optical head 38 includes, as is well known, a laser device, a light receiving device, a polarizing beam splitter, and so on. The laser device (not shown) irradiates a laser beam onto the magneto-optical recording medium or disc 10 during reproduction, as stated before. Meanwhile, the light receiving device, e.g., photo-diodes, of two in number detect respective reflected beams different in polarization

axis, depending upon a magnetizing polarity of a record or transferred magnetic domain (enlarged magnetic domain), thereby outputting a reproduced signal (RF signal).

Paragraph beginning at line 22 of page 8 has been amended as follows:

That is, to the control circuit 48 supplied modulated record data so that the control circuit 48 supplies a signal to the magnetic head driving circuit 52 according to the modulated record data. In response thereto, the magnetic head driving circuit 52 controls the pulse signal source to supply a drive signal to the magnetic head 36 such that a record magnetic domain is recorded into the recording layer of the magneto-optical recording medium or disc 10 in compliance with the record data. Incidentally, the frequency of an alternating current outputted by an alternating signal source, i.e., alternating magnetic field, is for example at 2.0 MHz in this embodiment. It is, however, possible to arbitrarily alter the frequency.

Paragraph beginning at line 8 of page 10 has been amended as follows:

In the recording/reproducing apparatus 30 in this embodiment, a calibration area 11 is formed on the magneto-optical recording medium or disc 10, as shown in Figure 6 to Figure 9. The calibration area 11 is an area <u>used</u> to adjust an output of an laser beam by reproducing a record signal contained <u>in</u> the same area. Note that, [where] <u>when</u> employing an apparatus having no recording function, i.e., an reproduction-exclusive apparatus, it is possible to utilize a magneto-optical recording medium or disc previously formed with such calibration areas.

53(b) Divisional of U.S. Patent Serial Number: 09/108,317

Paragraph beginning at line 21 of page 10 has been amended as follows:

By utilizing a disc 10 having such calibration areas 11, calibration [or] of laser beam output adjustment can be effected at a desired timing. For example, an optimal output of a laser beam can be determined by effecting a calibration at a time of initializing the disc. Otherwise, calibration can be carried out when loading a disc onto a recording/reproducing apparatus or a reproducing apparatus. In particular, if the disc of Figure 9 [be] is utilized, the laser beam output can be optimized by calibrations each time any of the zones comes to reproduction.

Paragraph beginning at line 9 of page 12 has been amended as follows:

After making the initial setting as above, the micro-computer 50 at a step S3 performs reproduction on the [calibration] calibration-signal magnetic domain recorded as stated before in the calibration area 11 (Figure 6 to Figure 9). That is, the micro-computer 50 enables the laser driving circuit 54 through the control circuit 48, in a manner similar to usual reproduction, to thereby drive the laser device 545 (Figure 5) at the initial power set at the step S2. The driving the laser device 545 causes the magnetic head 38 to output a laser beam 24 (Figure 2). Consequently, the calibration magnetic domain 22 in the recording layer 14 is transferred to the reproducing layer 16, as explained before, thus forming a seed magnetic domain withing the reproducing layer 16, due to a [calibration] calibration-signal magnetic domain. Then the micro-computer 50 sends a command signal to the control circuit 48. Accordingly, the magnetic head 36 produces an alternating magnetic field at an output set by the step S1. As the intensity of the magnetic field exceeds a magnetic domain-wall coercive force Hw, the seed magnetic domain 26

is enlarged to form enlarged magnetic domain portions 26a and 26b. That is, the [calibration] calibration-signal magnetic domain is transferred through enlargement. In response to a laser beam output at that time, a reproduced signal is provided through the optical head 38, for example as shown in Figure 13 (A) to Figure 13(C). This reproduced signal has peaks in number dependent upon the frequency of the alternating magnetic field. More specifically, when a laser beam 24 is irradiated, a seed magnetic domain 26 is created within the reproducing layer 16 due to a leak magnetic field from the recording layer 14 through the intermediate layer 18. This seed magnetic domain 26 turns into an enlarged magnetic domain of from 26a to 26b, for example, by a positive-polarity magnetic field of the external alternating magnetic field Hep, thus forming peaks in the reproduced signal.

In the Claims:

Claims 5-16 have been canceled.